

# **Natural Heritage & Endangered Species Program**

Massachusetts Division of Fisheries & Wildlife  
Route 135, Westborough, MA 01581  
tel: (508) 792-7270, ext. 200; fax: (508) 792-7821  
[www.state.ma.us/dfwele/dfw/nhesp](http://www.state.ma.us/dfwele/dfw/nhesp)

## **Subarctic Darner Dragonfly**

*Aeshna subarctica*

State Status: **Threatened**

Federal Status: None

**DESCRIPTION OF ADULT:** The Subarctic Darner is a stunning insect species in the order Odonata, suborder Anisoptera (the dragonflies), and family Aeshnidae (the darners). The adult is a large dragonfly magnificently colored with greens, blues, and rich browns. The thorax (winged and legged segment behind the head) is mostly brown, with two green to blue dorsal stripes and two blue-green to yellowish lateral stripes. The abdominal segments are predominantly brown with green to blue markings. The Subarctic Darner has black legs and transparent to amber-tinged wings. The face is yellow with a thin black cross-line, and the eyes are dull blue-gray to green in color.

Subarctic Darners range from 2.6 to almost 3 inches (66 - 76 mm) in overall length, with the females averaging somewhat larger. Wingspread ranges from 3.1 to 3.6 inches (78 - 92 mm).

**SIMILAR SPECIES:** Ten species of blue darners (genus *Aeshna*) occur regularly in Massachusetts and the Subarctic Darner closely resembles many of them in appearance. The slight differences in pattern and coloration distinguish the various species. The face of the adult Subarctic Darner is yellow with a black cross-line. In addition, the lateral thoracic stripes are bent forward in their upper halves, with the top of the stripe being pale blue fading down into yellow on the lower half of the stripe (Nikula *et al.* 2003). The Canada Darner, Green-striped Darner, and Lance-tipped Darner are similar in appearance, but lack the black cross-line on the face and the markings on the thorax and abdomen vary in shape and coloration. The Subarctic Darner is unlikely to be encountered outside of northern Massachusetts.

The nymphs are relatively long and slender, averaging about 1.4 inches (36 mm) in length when fully grown, and can be distinguished from other *Aeshna* using characteristics as per the keys in Walker (1958).

**HABITAT:** Sphagnum bogs and deep fens with wet sphagnum. The nymphs are aquatic, living in soupy sphagnum pools and among aquatic vegetation. The adults inhabit wooded uplands and clearings.



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**LIFE-HISTORY/BEHAVIOR:** Adult Subarctic Darners typically first appear in late July and are on the wing into early October.

The nymph of the Subarctic Darner is aquatic and is thought to develop in soupy sphagnum pools in bogs and deep fens. The amount of time required for the development of the eggs and nymphs is uncertain. The eggs probably hatch within a month, but the nymph may take as long as 3-4 years to reach maturity. As a nymph matures, it sloughs off its skin, or exoskeleton, at the end of each stage of growth or instar. The final cast skins, known as exuviae, can be found attached to emergent vegetation where nymphs crawl out to transform into adults. The exuviae can be used for specific identification and are a reliable, useful means for confirming the presence of a breeding population at a site.

### **SUBARCTIC DARNER FLIGHT PERIOD**

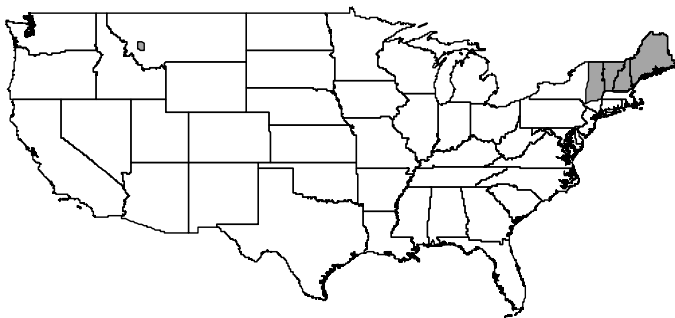
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Please allow the Natural Heritage & Endangered Species Program to continue to conserve the biodiversity of Massachusetts with a contribution for 'endangered wildlife conservation' on your state income tax form as these donations comprise a significant portion of our operating budget.

The immature dragonflies spend several days or more feeding and maturing in upland areas away from water, often some distance from the breeding site. Subarctic Darners, like other darners, feed on other aerial insects, which they capture on the wing. They are active through dusk. When at rest, they hang from vegetation in a vertical position, often high in the trees.

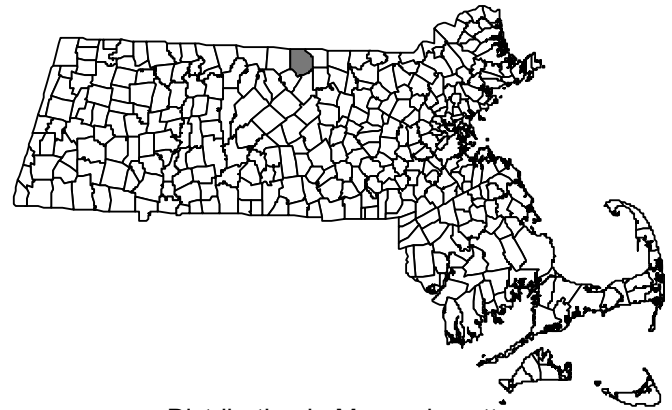
Males patrol the breeding site, flying over wetter areas of bogs and fens. When more than one male is present, aggressive interactions are frequent and often end with one male chasing another high over the tree-tops out of sight.

Female Subarctic Darners appear at the breeding sites when ready to breed. The appearance of a female generally results in a moment of fevered chaos as one or more males attempt to seize the female. The male uses the claspers at the tip of his abdomen to grab the female behind the eyes. If the female is receptive, she curls her abdomen upward to couple with the male on the underside of his second abdominal segment. Once successfully coupled, the pair flies off high into the nearby woodland to mate. Male dragonflies will mate with as many females as possible; the females may also mate with more than one male. Subarctic Darter females oviposit (lay eggs) in soupy sphagnum pools or along the edges of bogs. The number of eggs laid by an individual female Subarctic Darter is not known, but in many dragonfly species often numbers into the hundreds.



Range of Species in US

**POPULATION STATUS IN MASSACHUSETTS:** The Subarctic Darter appears to be an uncommon member of its genus in eastern North America, and is a Threatened species in Massachusetts. It is at the southern extent of its range in Massachusetts and is known from only two sites in the north-central part of the Commonwealth, both in Ashburnham. It is likely to occur elsewhere in northern Massachusetts, as suitable habitat is present at a number of sites. Breeding has been documented at one site. As with all species listed in Massachusetts, individuals of the species are protected from take (picking, collecting, killing, etc...) and sale under the Massachusetts Endangered Species Act.



Distribution in Massachusetts  
1977 - 2002

Based on records in Natural Heritage Database

**RANGE:** The Subarctic Darter is a circumboreal species whose range extends across much of northern Europe, across into Japan, and through Canada. It dips down into New England, with northern Massachusetts and central New York at the southern edge of its range in this region.

**MANAGEMENT RECOMMENDATIONS:** The greatest threat to this species is likely to be the destruction or degradation of wetlands from development and the impacts of pollution resulting from road run-off. As Subarctic Darter, like many species of dragonflies, spend a period of several days or more maturing away from wetlands, it is important to maintain upland habitats adjoining the breeding sites for roosting and hunting. Without protected uplands the delicate newly emerged adults are more susceptible to predation and mortality from inclement weather.

#### REFERENCES:

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- Walker, E.M. 1958. *The Odonata of Canada and Alaska, Vol. II*. University of Toronto Press.